



# UNITED STATES PATENT AND TRADEMARK OFFICE

57  
UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/886,255	06/22/2001	Satoshi Denno	210215US2	5540
22850	7590	10/04/2004	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			MEEK, JACOB M	
			ART UNIT	PAPER NUMBER
			2637	

DATE MAILED: 10/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/886,255	<b>Applicant(s)</b> DENNO, SATOSHI	
	<b>Examiner</b> Jacob Meek	<b>Art Unit</b> 2637	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 June 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 - 32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9, 12 - 25, 28 - 32 is/are rejected.
- 7) ☒ Claim(s) 10,11,26 and 27 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/01</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Objections***

1. The claims are objected to because of the following informalities:

In claims 1, 14, 17 and 30, "receiving a receive signal converted into " needs to be clarified to state more clearly the operation. "Receiving a receive signal converted into a first IF band", would appear to be a more appropriate description. Also, "receive" may be better stated as "received" for the purposes of clarity. Generating part description of these claims would be more appropriate stating the generation of in-phase (I) and quadrature (Q) signals. Compensation and conversion parts should replace "receive" with "in-phase" to be more consistent with the widely understood terms in the art. Appropriate correction is required.

In Claims 1 - 4, and 17 - 21 Receive signal appears to be used interchangeably throughout the claims to be either, the complex received signal or the in-phase ( I ) component. "Receive signal" should be replaced with "in-phase signal" as appropriate.

In Claims 2, 3, 8, 9, wherein should precede "said" in these claims.

In Claims 1 - 4, 12, 13, 17 - 20, 22 - 24 are objected to because of the following informalities: Nouns in these claims lack articles (a, an).

In Claims 2, 14, 18, 30 the term divided and dividing part is used to describe a step in the operation, however, there appears to be no "divider" in the drawings to support this function. Also, as shown in Figure 5 and 6, compensation occurs on "undivided signals." Claims need to be revised to reflect operation of invention as disclosed.

In Claims 5, 8 - 13, 21, 23, and 24 Claims recite "said weight." This appears inappropriate given that antecedent discusses both signals (1<sup>st</sup> and 2<sup>nd</sup>).

In Claims 10 – 13, 26 – 29, Claims recite “desired” and “predetermined” signals.

Examiner is unclear as to difference in signals, the specification seems to indicate they are the same, which may change examiner's view of allowability.

In Claim 14, “in-phase and quadrature signal” should be in-phase and quadrature signals.

In Claim 20, line “said receive signal and said quadrature signal, which are compensated” would be more appropriate as “said receive compensated signal and said quadrature compensated signal”

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 12, 13, 28 and 29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. “Said sampled signal” in last line of these claims could refer to the sampled signal in the 1<sup>st</sup> or 2<sup>nd</sup> line of these claims.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1 – 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Glas (US Patent 6,330,290).

With regard to Claim 1, Glas teaches a method for converting a receive signal into a carrier band (see Figure 2, references 118, 20, 22, 25), generating a quadrature signal (see 118, 20, 24, 25'), compensating gain and phase errors (See figure 2, references 102, 104), converting receive and quadrature signals into a first complex signal (see Figure 2, references 32 for I and 36 for Q).

With regard to Claim 2, limitations of Claim 1 above, plus the compensation of phase (orthogonality) errors and gain imbalance with the steps of assigning weight to quadrature signal (See Figure 2, reference 104), dividing the quadrature signal (see Figure 2, references 36, 38), and adding receive signal to one of divided quadrature signals (See figure 2, ref 32, 38, I<sub>1</sub>, QQ, 52).

With regard to Claim 3, limitations of Claim 1 above plus the compensation of gain and phase errors with the steps of assigning weights to receive and quadrature signals (see Figure 2, reference 102, 104) and adding receive and quadrature signals (See figure 2, reference 106).

With regard to Claim 4, limitations of Claim 2 above plus the conversion of, after compensation, receive and quadrature signal into 2<sup>nd</sup> complex signal (see Figure 2, reference 34, 36, IQ, Q1, 54).

With regard to claim 5, limitations of Claim 4 above plus the addition of weights being determined by a 2<sup>nd</sup> complex frequency band signal (see Column 4, 19 – 35, equations 8c and 8d, column 9, 1 – 10). Glas clearly states that his apparatus is able to derive this signal (see Column 6, line 44 – col. 7, line 16).

With regard to claim 6, limitations of claim 2 as taught above plus the estimation of desired signal based on 1<sup>st</sup> complex signal (see Column 4, 19 – 35, equations 8a and 8b, column 9, 1 – 10).

With regard to claim 7, limitations of claim 3 as taught above plus the estimation of desired signal based on 1<sup>st</sup> complex signal (see Column 4, 19 – 35, equations 8a and 8b, column 9, 1 – 10).

With regard to claim 8, limitations of claim 6 above plus the addition of weight is determined by 1<sup>st</sup> complex signal and desired signal (column 6, 39 – column 7, line 47).

With regard to claim 9, limitations of claim 7 above plus the addition of weight is determined by 1<sup>st</sup> complex signal and desired signal (column 6, 39 – column 7, line 47).

4. Claims 14 - 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Glas (US Patent 6,330,290).

With regard to Claim 14, Glas teaches a receive method of down-converting received signal (see Figure 2, reference 12, 14, 16, 126), performing analog detection on received signal and outputting in-phase and quadrature signals (see Figure 2, references 20, 22, 24), performing A/D conversion of I and Q signals (see Figure 2, 27 & 27'), dividing I and Q signals into 1<sup>st</sup> I and Q and 2<sup>nd</sup> I and Q signals (see Figure 2, 32,34,36,38), converting 1<sup>st</sup> and 2<sup>nd</sup> I and Q signals into 1<sup>st</sup> complex analytic signal (see Column 4, 19 – 35, equations 8a and 8b, column 9, 1 – 10) and 2<sup>nd</sup> complex analytic signal (see Column 4, 19 – 35, equations 8c and 8d, column 9, 1 – 10), applying 1<sup>st</sup> and 2<sup>nd</sup> I and Q signals to a 1<sup>st</sup> and 2<sup>nd</sup> low pass filter (see Figure 2, I<sub>1</sub>, IQ, Q<sub>1</sub>, QQ, 52, 54, I<sub>2</sub>, Q<sub>2</sub>, 58, 60) and then to an interference canceller (see Figure 2, 56) for the removal of interference components from 1<sup>st</sup> and 2<sup>nd</sup> signals (see Column 9, 1 – 67). Examiner interprets the operation of this device to provide equivalent functionality by performing signal analysis on desired signals (Eq. 8a and 8b) through low-pass filters

(Figure 2, ref 58, 60), and image (interfering) signal (Eq. 8c and 8d) through low-pass filters under control of DSP (see Fig 2, ref 56) and adders (see Figure 2, 52 and 54).

With regard to claim 15, limitations of claim 14 above plus adaptive interference canceller separates desired frequency band components and interference components using orthogonal coefficients (see column 4, 19 – column 5, 35 and column 6, 44 – column 7, 47).

With regard to claim 16, limitations of claim 15 above, plus the limitation of updating coefficients according to changes in analog section (see column 2, 44 – 51).

5. Claims 17 – 25 are rejected under 35 U.S.C. 102(e) as being anticipated by Glas (US Patent 6,330,290).

With regard to Claim 17, Glas teaches a receiver using the method of claim 1 above.

With regard to Claim 18, Glas teaches a receiver using the method of claim 2 above.

With regard to Claim 19, Glas teaches a receiver using the method of claim 3 above.

With regard to Claim 20, Glas teaches a receiver using the method of claim 4 above.

With regard to Claim 21, Glas teaches a receiver using the method of claim 5 above.

With regard to Claim 22, Glas teaches a receiver using the method of claim 6 above.

With regard to Claim 23, Glas teaches a receiver using the method of claim 7 above.

With regard to Claim 24, Glas teaches a receiver using the method of claim 8 above.

With regard to Claim 15, Glas teaches a receiver using the method of claim 9 above.

6. Claims 30 - 32 are rejected under 35 U.S.C. 102(e) as being anticipated by Glas (US Patent 6,330,290).

With regard to Claim 30, Glas teaches a receiver using the method of claim 14 above.

With regard to Claim 31, Glas teaches a receiver using the method of claim 15 above.

With regard to Claim 32, Glas teaches a receiver using the method of claim 16 above.

***Allowable Subject Matter***

7. Claims 10 – 13, 26 – 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Examiner did not find descriptions of the operations described in these claims utilizing the 3 signals (predetermined, 1<sup>st</sup> complex , and desired) described by applicant in cited reference.

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references teach I/Q compensation and interference cancellation techniques, which appear to be closely related to the field of invention: Koslov (US Patent 6,044,112). Ozlurtuck (US Patent 6,377,620), Liu et al (US Patent 6,219,088), Conrad (US Patent 5,105,195).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacob Meek whose telephone number is (571)272-3013. The examiner can normally be reached on 8:00 - 4:30.

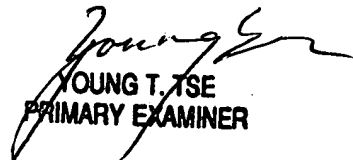
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571)272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



Art Unit: 2637

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JMM

  
YOUNG T. TSE  
PRIMARY EXAMINER